

Commissioner for Patents

Serial Number 09/990,876

REMARKS

The Examiner has rejected claims 4-12, 15-16, and 19-21 under 35 U.S.C. 112(1) as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. In particular, the Examiner points out the following part of claims 4, 8, and 19:

"the two footprints are positioned at an upper portion of the computer card, and the farther one of the two footprints is located at a horizontal distance from said vertical edge greater than a horizontal distance of a lower cut-out accommodating a double-high connector, whereby a same I/O connector connectable to the farther footprint could reach a footprint located on a lower portion of the computer card"

and states that it is unclear as to what the farther one of the two footprints located at a horizontal distance from the vertical edge greater than a horizontal distance of a lower cut-out accommodating a double-high connector is.

The Applicant has amended claims 4, 8, and 19 to clarify what is meant. The vertical edge having a lower cut-out has been added as an element of each claim. Support for the amendment can be found in the detailed description in figure 14 and on page 10, paragraph 71 where it states that:

"FIG.14 illustrates a 2-dimensional side view of an NLX form factor I/O card 23 plugged into an AGP slot of an NLX form factor motherboard 24. The I/O card 23 is designed with cut-out 23a to enable it to fit over the double-high connectors 25 mounted on the NLX motherboard."

The lower cut-out referred to in the claims is identified by reference number 23a in figure 14, as seen from the citation above. This cut-out can also be seen in figure 12. Also illustrated in figure 12 are the two footprints referred to in the claims. The first footprint 1 is the closer one to the vertical edge of the card 23. The second footprint 10 is the farther one of the two footprints on the card 23. From figure 12, it can be seen that footprint 10b is placed at a distance from the vertical edge that is further than the vertical edge defining the cut-out 23a. Therefore, the Applicant believes it

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can now be understood from the drawings and the specification what is meant in claims 4, 8, and 19. Claims 5, 9 and 20 have also been amended to correspond to amended claims 4, 8 and 19.

Claim 8 has further been amended and is now in independent format. All of the limitations of the previously amended claim 1 are now in claim 8. Claim 19 has further been amended and is now in independent format. All of the limitations of previously amended claim 17 are now in claim 19. Support for this amendment can be found in the original specification where claims 8 and 19 were previously dependent on claims 1 and 17, respectively. No new subject matter has been introduced by the amendment.

The Examiner has rejected claims 4-12, 15-16, and 19-21 under 35 U.S.C. 112(2) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. In particular, the Examiner states that industry standards "NLX" and "ATX" form factors are indefinite. The Applicant has amended the claims comprising the references to the industry standards and removed such references. The Applicant believes the amendments overcome the Examiner's rejection.

The Examiner has rejected claims 1-2, 13, and 17-18 under 35 U.S.C. 102(b) as being anticipated by Tan et al. (5,772,453).

Tan et al. describe an arrangement for the adoption of either the traditional UART D-Sub connector or the upgrading USB connector with a same motherboard. The design comprises a side-by-side dual-port USB connector assembly with a traditional D-Sub connector.

The Applicant has amended independent claims 1 and 17 to distinguish itself over Tan et al. Claim 1 now reads a computer motherboard-mounted graphics card having at least one I/O connector, the card comprising: two footprints positioned one behind the other for accommodating two different output types, wherein a closer one of the two footprints from a vertical edge of the card is for a DVI connector and a farther one of the two footprints from a vertical edge of the card is for an HD-15

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connector; and one right-angle, vertical edge, I/O connector mounted with pins in a selected one of the two footprints. The amendment to claim 1 consists substantially in bringing the subject matter of dependent claims 13 and 14 into the independent claims. No new subject matter has been introduced. Claims 13 and 14 have been cancelled.

Tan et al. does not describe having one footprint for a DVI connector and one footprint for an HD-15 connector. Furthermore, Tan et al. does not describe placing the DVI connector closer to the vertical edge than the HD-15 connector. Therefore, amended claim 1 is not anticipated by Tan et al.

Amendments were made to claims 2, 15, and 16 in order to correspond with the amendment of claim 1. Claim 15 was cancelled entirely and parts of claim 16 were removed. Claim 2 was modified for antecedent purposes.

The same type of amendment has been done to claim 17. The newly amended claim 17 now reads a method of manufacturing motherboard-mounted computer graphic cards having at least one I/O connector, the method comprising: providing at least two footprints positioned on each one of said computer cards for accommodating two different output types, wherein a closer one of the two footprints from a vertical edge of each card is for a DVI connector and a farther one of the two footprints from a vertical edge of each card is for an HD-15 connector; providing a plurality of different right-angle, vertical edge, I/O connectors having mounting pins receivable by a selected one of the at least two footprints, said I/O connectors being adapted to reach the selected one of said footprints while providing a vertical edge I/O connector substantially at a common position with respect to said cards; selectively mounting one of said plurality of I/O connectors to one of said footprints to manufacture cards having a first I/O connector configuration; and selectively mounting another one of said plurality of I/O connectors to another one of said footprints to manufacture cards having a second I/O connector configuration.

The amendment to claim 17 is reflective of the structure now recited by claim 1 and is therefore not new subject matter.

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Claim 17 has also been amended to better define the Applicant's invention. There is support for the amendment at several instances in the application. The application describes a method of manufacturing motherboard-mounted computer cards from the same base-card, such as the one shown in fig. 12, by selectively mounting one type of I/O connector to one of the footprints to manufacture cards having a first configuration and mounting another I/O connector to another footprint to manufacture cards having a second I/O configuration. No new matter was introduced and the amendment is aimed at clarifying the language of the claims.

The Applicant believes newly amended claims 1 and 17 not to be obvious from Tan et al. It is known from the prior art that edge connectors are to be placed near the edge of a card. Tan et al. teaches that it is possible to have a connector further away from the edge. However, the USB connectors in Tan et al. are low bandwidth connectors and therefore, their position with respect to the edge of the card is not critical. There is no suggestion from Tan et al. that two high bandwidth connectors, such as DVI and HD-15, can be placed in a similar configuration.

The applicant has found that for a digital signal, it is critical to be close to the edge because of the discrete nature of the signal. In the case of an analog signal, there is some signal degradation but it is not significant. The maximum bit rate of the Applicant's DVI interface is 1.65 Gbps (Gigabits per second), while the maximum pixel clock rate of the HD-15 is 400 MHz. The edge rate (the time the signal takes to make a transition from 0 to 1 or 1 to 0) of the digital signal (DVI) is roughly 5 times higher than that of the analog signal (HD-15). The edge rate of the digital signal being much faster than that of the analog signal, the signal quality is much more affected by the connector non-ideal impedance .

The connector designs are such that for both the HD-15 and DVI, the impedance of the connector is non-ideal, i.e. different than the cable impedance. The longer the connector pin is, the longer the impedance mismatch is, and the higher the signal degradation is. Since the edge rate of the digital signal is higher,

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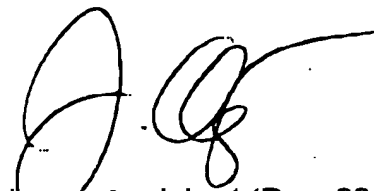
this signal is much more affected than the analog one, and as such, this is why it is important that the DVI connector be closer to the edge of the board,

The Applicant believes the amendments to claims 1 and 17 overcome the Examiner's rejection of the claims and that claims 1 and 17 are now patentable in view of the cited prior art. Claims 2 to 12, 16 and 18 to 21 are also patentable because they are dependent on claims which are believed to be patentable.

In view of the foregoing, a Notice of Allowance for claims 1-12 and 16-21 is respectfully requested.

Respectfully submitted,
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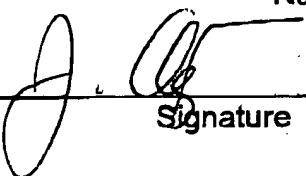
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